



EcoPurchasing means
considering attributes
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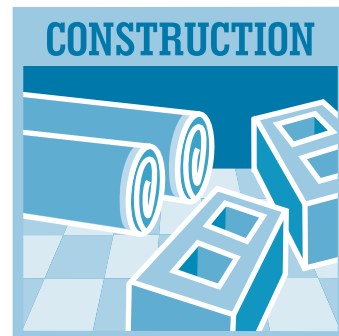
recycled content
toxicity
reusability
durability
repairability



before you buy
a product.

1996 Buy-Recycled Series Construction Products

Meeting your commitment to buy recycled products could have you walking on soda bottles, keeping warm with newspapers, and building with ash! The Comprehensive Procurement Guideline (CPG) designates items that federal agencies and their contractors must purchase with recovered materials. Among these items, the CPG designates several construction products, ranging from carpet made from recovered plastic to insulation made from yesterday's news. U.S. Environmental Protection Agency (EPA) research shows the items listed in the CPG to be safe, high quality, widely available, and cost-competitive with virgin products. So, whether you are managing building projects for your agency or redecorating the director's office, now is the time to purchase products made from recovered materials.



In the CPG, EPA designates a variety of recycled-content construction products, including structural fiberboard, laminated paperboard, several types of insulation, floor tiles, patio blocks, and polyester carpet face fiber. To help you buy these products, the CPG's companion publication, the Recovered Materials Advisory Notice (RMAN), recommends recovered materials content levels for them.

Remember, even if a contractor is procuring the materials on your behalf, you still direct the purchase. So when writing contracts for construction, decorating, or renovation work, direct architects to specify, and contractors to procure, designated building products made with recovered materials whenever practicable.





What Is The CPG?

How Do I Purchase Recycled-

The CPG requires federal agencies to give preference to items made from recovered materials.

Although the reuse of recovered materials is increasing across America, many usable materials still find their way to solid waste disposal facilities. Recycling of these materials will increase as demand for products made from them increases. Towards that end, Section 6002 of the Resource Conservation and Recovery Act (RCRA) and Executive Order 12873 direct federal agencies to purchase recycled content products whenever possible. EPA developed the CPG in response to RCRA and President Clinton's Executive Order. The 1995 CPG:

- Designates 19 new products and incorporates 5 previously designated items (including cement and concrete containing coal fly ash and insulation).
- Applies to all procuring agencies (any federal, state, or local agency or contractor using federal funds) spending more than \$10,000 a year worth of a designated item.
- Applies to a procuring agency's lease contracts for designated items.

The CPG acknowledges that specific circumstances could arise that would preclude the purchase of products made with recovered materials. Under the CPG, you may purchase designated items that do not contain recovered materials if you determine that (1) the price of a given item made with recovered materials is unreasonable, (2) there is inadequate competition (not enough sources of supply) for the item, (3) unusual and unreasonable delays would result from obtaining the item, or (4) the item does not meet your agency's reasonable performance specifications.

Key Words

Before purchasing construction products containing recovered materials, you may need to review certain key terms.

Postconsumer materials: These are materials or finished products that have served their intended use as consumer items and have been diverted or recovered from waste destined for disposal.

Recovered materials: These are waste materials and by-products of manufacturing processes that have been recovered or diverted from solid waste. Materials and by-products normally reused within an original manufacturing process (the same process from which they were generated) are not included.

Coal fly ash: Coal fly ash is a by-product of coal-burning at electric utility plants. It is called "fly" ash because it is transported from the combustion chamber by exhaust gases.

Ground granulated blast furnace slag (GGBF): Blast furnace slag is a by-product of iron blast furnaces. The slag is ground into granules finer than portland cement and may be used as an ingredient in concrete.

Rock wool: This composition of fibers manufactured from slag or natural rock is used in building insulation.

Structural fiberboard: This is a panel made from wood, cane, or paper fibers matted together and used for sheathing, structural, or insulating purposes.



Content Construction Products?

Laminated paperboard: These boards are made from one or more plies of paper bonded together and may be used for decorative, structural, or insulating purposes.



The Recovered Materials Advisory Notice

EPA published the RMAN as nonregulatory guidance accompanying the CPG. When writing contracts for construction, renovation, decorating, or rehabilitation work, use the RMAN to specify the recovered material levels of the construction products to be purchased. EPA recommends specific content levels for some items and a range of recovered material content for other products, as shown in Table 1. For products with recommended ranges, consult your local suppliers and specify the highest recovered materials content available to you. In addition, recognizing that cement and concrete mixtures are specified on a job-specific basis, EPA recommends that contractors follow industry specifications for mixing cement and concrete with recovered materials. Table 2 lists relevant cement and concrete specifications. To learn more, follow along on a construction products procurement journey from the foundation to the finishing touches.

Laying the Foundation—Cement and Concrete

Your agency is replacing the concrete walkways leading to the main entrance. Or, perhaps you sit on a committee awarding contracts for the construction of a new highway or airport runway. In any case, most large construction projects use vast amounts of concrete. Require contractors to mix concrete containing the highest practicable amount of coal fly ash or GGBF slag. These recovered materials are readily available in many states as ingredients of cement or concrete. They are used frequently in cement and concrete in highways, bridges, dams, buildings, and subway stations. Yet, of the 48 million tons of coal fly ash produced in the United States in 1993, only 22 percent, was used in cement, concrete, and other applications. Clearly, we need to expand markets for these valuable recovered materials.

CASE STUDY: Army Corps of Engineers

The engineers at the Army Corps are no strangers to mixing cement and concrete using recovered materials. Corps' contracts have specified the use of coal fly ash concrete for more than 20 years and, more recently, have required the use of GGBF slag in concrete mixes for buildings and roads. While pleased with the overall performance of both recovered materials, Corps engineers say they particularly like the improved workability that coal fly ash provides over concrete mixed with portland cement. For more information, contact Greg Hughes of the Army Corps of Engineers at 202 761-4140.

**The RMAN
recommends
recycled content
ranges that
reflect actual
market
conditions.**

How Do I Purchase Recycled-Content Construction Products? (Continued)

Table 1. Recommended Recovered Materials Levels For Designated Construction Products

Product	Material	Percent of Post-consumer Materials	Percent of Total Recovered Materials
Structural Fiberboard	Recovered materials	—	80-100
Laminated Paperboard	Postconsumer paper	100	100
Rock Wool Insulation	Slag	—	75
Fiberglass Insulation	Glass cullet	—	20-25
Cellulose Insulation (loose-fill and spray-on)	Postconsumer paper	75	75
Perlite Composite Board Insulation	Postconsumer paper	23	23
Plastic Rigid Foam, Polyisocyanurate/polyurethane: Rigid Foam Insulation	Recovered material	—	9
Foam-in-Place Insulation	Recovered material	—	5
Glass Fiber Reinforced Insulation	Recovered material	—	6
Phenolic Rigid Foam Insulation	Recovered material	—	5
Floor Tiles (heavy duty/commercial use)	Rubber	90-100	90-100
	Plastic	—	90-100
Patio Blocks	Rubber or rubber blends	90-100	90-100
	Plastic or plastic blends	—	90-100
Polyester Carpet Face Fiber	Polyethylene terephthalate (PET) resin	25-100	25-100

Table 2. Specifications for Cement and Concrete Containing Recovered Materials

Cement Specification	Concrete Specifications
<ul style="list-style-type: none"> ASTM C 595, “Standard Specification for Blended Hydraulic Cements.” ASTM C 150, “Standard Specification for Portland Cement.” AASHTO M 240, “Blended Hydraulic Cements.” 	<ul style="list-style-type: none"> ASTM C 618, “Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.” ASTM C 311, “Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.” ASTM C 989, “Ground Granulated Blast-Furnace Slag for Use in Concrete Mortars.” AASHTO M 302, “Ground Granulated Blast Furnace Slag for Use in Concrete and Mortars.” American Concrete Institute Standard Practice ACI 226.R1, “Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete.”



The amount of recovered material you use in your concrete will depend on the specific circumstances of your project. Some of the variables that will determine the precise mix include the end use, quality of slag or coal fly ash available in your area, and the influence of weather conditions on drying time. The level of coal fly ash in concrete typically ranges from 15-35 percent of total cementitious material, but may reach 70 percent in massive walls, girders, road bases, and dams. The level of GGBF slag usually ranges from 25 to 50 percent.

Other Federal Success

- One hundred percent of the concrete purchased by the General Services Administration (GSA) Region 4 during FY95 was mixed with coal fly ash.
- Three other GSA regions reported 80 percent use of concrete with recovered materials.
- More than half the concrete purchased by the Department of Labor and the National Aeronautics and Space Administration in 1994 contained coal fly ash.
- The Navy is encouraging the use of up to 91 percent coal fly ash in its high-performance concrete used for waterfront applications.

When you specify the use of coal fly ash or GGBF slag in the concrete mix, the concrete contractor will consider all variables in designing the required mix. In most cases, concrete mixed with recovered coal fly ash or slag will improve the workability and ultimate strength of the concrete. It also can cost less than concrete mixed only with portland cement. In addition, concrete made with coal fly ash can reduce permeability and help resist sulfate attack. Concrete mixtures using GGBF slag have been tested and approved for roadway construction in 15 states and the District of Columbia.

Putting Up Walls—Structural Fiberboard and Laminated Paperboard

With the foundation set and major structural components in place, your contractors will begin installing walls, ceilings, and roofing. Or, perhaps, you've gutted your office building for renovation and will build new walls and ceilings to make more efficient use of the space. Whatever the case, when contractors use any construction products made from fiberboard or laminated paperboard, require them to purchase products made from recovered wood and paper fibers.

Although you may think of them as insulation products, contractors also use fiberboard and laminated paperboard for structural applications. You may recognize these products by some of the other names they are called: building board, sheathing, and sound-deadening board to name just a few. Because federal agencies buy a great deal of fiberboard and laminated paperboard—\$5.3 million worth in 1990—purchasing them with recovered material content can greatly increase recycling of wood and paper waste.

Common Fiberboard And Laminated Paperboard Products

- | | |
|-------------------------|---|
| • Building board | • Roof insulating board |
| • Insulating formboard | • Insulating wallboard |
| • Insulation board | • Acoustical and non-acoustical lay in panels |
| • Sheathing | • Floor underlayments |
| • Shingle backer | • Roof overlay (coverboard) |
| • Sound-deadening board | |



How Do I Purchase Recycled-Content Construction Products? (Continued)

Building in Climate Control— Insulation Products

Naturally, after the walls and ceilings are built, you want to insulate your building to make it as energy efficient as possible. Building contractors use different kinds of insulation for different applications, based on the circumstances of the project. Insulation made from recovered materials is available for many applications, including spraying cellulose or foam insulation into existing walls and installing cellulose or fiberglass insulation in a new wall or ceiling. Types of recycled-content insulation include those made from recovered glass, slag, paper fiber, and plastics. One manufacturer grinds postconsumer glass bottles into a substitute for the sand used in glass fibers. Others use slag in rock wool or old newspaper in cellulose insulation. So, when directing building or renovation projects, ask contractors to purchase the appropriate insulation made with the highest practicable level of recovered materials. You will help recycling and there's plenty of room for growth. In 1994, only 35 percent of paper and less than 5 percent of plastics were recovered from the nation's waste stream.

Federal Successes

- In addition to using rock wool made from slag to insulate underground heat and hot water distribution systems on bases, the Navy uses recovered slag rock wool to insulate shipboard hot water pipes.
- The Army used recycled-content fiberglass to insulate barracks at Ft. Rucker, Alabama.

Insulation Myths

Whether choosing insulation for renovation or initial construction, do not be influenced by some popular misconceptions about insulation made with recovered materials.

Cellulose Insulation

Myth: Cellulose insulation made from postconsumer paper is a fire hazard.

Fact: All cellulose insulation, including that made from postconsumer materials, must meet flammability standards set by the Consumer Products Safety Commission. Due to its density, cellulose insulation keeps oxygen (the fuel of fire) away from structural building components, making them fire resistant. In addition, a 1994 study conducted by the National Research Council of Canada confirmed that cellulose insulation is fire resistant.

Fiberglass Insulation

Myth: Fiberglass insulation made with recovered glass is less effective than that made with virgin materials.

Fact: Properly processed recycled-content fiberglass insulation offers the same "R" value (thermal protection) as insulation made entirely from virgin stock.



Finishing Touches—Carpeting, Floor Tiles, and Patio Blocks

One of the last things to go into a new building is the flooring. It is also often one of the first things to be replaced as a building ages. In the 1995 CPG, EPA designated several types of flooring made from recovered materials including carpeting, floor tiles, and patio blocks.

When purchasing carpeting for interior offices or other moderate use areas, require your contractors to use recycled fiber polyester carpets. These carpets, manufactured from recycled soda bottles, wear better than carpets made with virgin polyester because the standards for food grade plastics are more rigorous than those for virgin carpet fiber plastics. As many as 40 soft drink bottles are used to make the fiber in one square yard of polyester carpet made from 100 percent recycled PET.

Specify resilient floor tiles made from recycled rubber or recovered plastic when surfacing floors in areas where grease, tar, snow, ice, moisture, or similar substances are likely to be present. (e.g., raised, open-web tiles for drainage or school kitchen flooring). You

can purchase floor tiles containing up to 100 percent postconsumer rubber—mostly from high grade truck and airline tires. Recovered content plastic flooring is produced in sheets that can be cut into any size tile.

Patio blocks made from recovered rubber and plastic are used in garden walkways and trails. Patio blocks containing 90 to 100 percent postconsumer rubber, plastic, or rubber or plastic blends have been proven to work well.

CASE STUDY: Naval Security Group, Chesapeake, Virginia

In 1993, when President Clinton issued his Executive Order on federal purchasing of recycled products, the Purchasing Department of the Naval Security Group (NSG) in Chesapeake, Virginia, enthusiastically accepted his challenge. When they needed carpet, the NSG conducted research to see whether recycled content carpet could meet performance needs. They visited a church that had installed polyester carpet made from recycled soda bottles three years earlier. Officials were so impressed by what they saw that they now buy all their carpets with 100 percent postconsumer plastic and have been satisfied with the carpets' performance in hallways, officers' quarters, and office spaces. For more information, contact Diane Broadway of NSG at 804 421-8000.

How Do I Get More Information?



Information Available from EPA

The following publications on buying recycled and the CPG are available through the RCRA Hotline. To order, call 800 424-9346 (or TDD 800 553-7672 for the hearing impaired). In Washington, DC, the number is 703 412-9810 or TDD 703 412-3323. These are also available on EPA's Public Access Server on the Internet (gopher.epa.gov).

❖ **Federal Register** notices establishing the CPG (60 FR 21370/EPA530-Z-95-006), May 1, 1995, and the RMAN (60 FR 21386/EPA530-Z-95-007), May 1, 1995.

- ❖ **EPA Issues Comprehensive Procurement Guideline** (EPA530-F95-010). This four page fact sheet provides general information about the CPG and the development of affirmative procurement programs.
- ❖ **Environmental Fact Sheet—EPA Guideline for Purchasing Cement and Concrete Containing Fly Ash** (EPA530-SW-91-086). This two page fact sheet provides general information about concrete mixed with coal fly ash.
- ❖ **Construction Products Containing Recovered Materials** (EPA530-B96-002). This list includes construction products containing recovered materials.

How Do I Get More Information? (Continued)



Other Sources of Information

- ❖ **American Society for Testing and Materials (ASTM).** ASTM publishes the standards for mixing cement and concrete included in this fact sheet. Contact: ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Phone: 610 832-9500. Fax: 610 832-9555.
- ❖ **The American Association of State Highway and Transportation Officials (AASHTO).** AASHTO publishes concrete and cement mixing specifications, which are listed in this fact sheet and in the RMAN. Contact: AASHTO, 444 North Capitol St., NW., Suite 249, Washington, DC 20001. Phone: 202 624-5800. Fax: 202 634-5806.
- ❖ **Greening the Government: A Guide to Implementing Executive Order 12873.** This publication explains how Executive Order 12873 changes federal purchasing. It includes case studies and resources for purchasing a variety of products containing recovered materials. Available from the Office of the Federal Environmental Executive, Mail Code 1600, 401 M Street, SW., Washington, DC 20460. Phone: 202 260-1297. Fax: 202 401-9503. E-mail: mcpoland.fran@epamail.epa.gov.
- ❖ **Resource Guide to Recycled Construction Products.** This recycled construction products list is available from the Los Angeles Integrated Solid Waste Management Office. Phone: 213 237-1444.
- ❖ **American Concrete Institute (ACI).** ACI publishes the standard for concrete containing GGBF slag listed in this fact sheet. ACI also offers several other relevant publications. Contact: ACI, P.O. Box 9094, Farmington Hills, MI 48333.
- ❖ **U.S. General Services Administration (GSA).** GSA's *Environmental Products Guide* catalogs environmentally preferable products and services available through the Federal Supply Service. Copies of *Carpet*, *Carpet Tiles*, and *Carpet Cushion*, *Multiple Award Schedule FSS72-I-A* is also available. Contact GSA, Centralized Mailing List Service (7CAFL), 4900 Hemphill St., P.O. Box 6477, Fort Worth, TX 76115. Phone: 817 334-5215. Fax: 817 334-5227.
- ❖ **The Harris Directory of Recycled Content Building Materials.** This computer database for Windows lists construction products made with recovered materials in a Construction Specifications Institute (CSI) format. Contact B.J. Harris, 508 Jose Street, #913, Santa Fe, NM 87501-1855. Phone: 505 995-0337. Fax 505 820-1911
- ❖ **Federal Highway Administration (FHWA).** With assistance from the American Coal Ash Association, Inc, FHWA published *Fly Ash Facts for Highway Engineers* (FHWA-SA-94-081), August 1995. It also maintains a database of state specifications for using coal fly ash and GGBF slag. Contact: Federal Highway Administration, 400 Seventh St., S.W., Washington, DC 20590. Phone: 202 366-1286.
- ❖ **Official Recycled Products Guide (RPG).** Several construction products are included in this directory. Contact: Recycling Data Management Corp., P.O. Box 577, Ogdensburg, NY 13669. Phone: 800 267-0707.
- ❖ **The Green Pages: The Contract Interior Designer's Guide to Environmentally Responsible Products and Materials.** Contact: Andrew Fuston, 74 Trinity Place, Suite 1805, New York, NY 10006-2003. Phone: 212 778-3365.
- ❖ **A Guide to Resource Efficient Building Elements.** In addition to tips on efficient design and job-site recycling, this guide lists several manufacturers that make products using recovered materials. Contact: Center for Resourceful Building Technology, P.O. Box 100, Missoula, MT 59806. Phone: 406 549-7678.
- ❖ **Environmental Building News.** This bimonthly newsletter on environmentally sustainable design and construction includes articles on new products and materials, technologies, and construction methods. Contact: RR 1 Box 161, Brattleboro, VT 05301. Phone: 802 257-7300.

In addition, contact your state solid waste agency for information about local and regional businesses that produce or distribute recycled-content construction products.



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Environmental Protection Agency
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